Consideration of citizen petition for rule change to allow high-speed boating on Shipshewana Lake, a "small lake" located in LaGrange County; Administrative Cause No. 11-158L

For consideration is a citizen petition seeking to authorize, by rule, the operation of motorboats on Shipshewana Lake in LaGrange County. The petition is governed by IC 14-15-3-11, a statutory section which includes two elements. IC 14-15-3-11 is set forth below in the "Indiana Department of Natural Resources Response to Petition to Increase the Speed Limit on Shipshewana Lake Each Day of the Week from $1-4\,\mathrm{PM}$ ". The first element anticipates the opportunity for an adjudicatory proceeding under IC 4-21.5 (sometimes referred to as the "AOPA"). The second element anticipates the possibility of rule adoption by the Natural Resources Commission under IC 4-22.

The first element was considered and given final adjudication in *Taylor v. DNR*, Administrative Cause No. 11-122L. In brief, the adjudication determined a majority of abutting property owners signed the petition and that Shipshewana Lake is a "small lake" which qualifies for a petition under IC 14-15-3-11. A "small lake" is one containing less than 200 acres, but to qualify for an exemption from a ten-mile-per-hour speed limit that would otherwise apply, a small lake must contain at least 70 acres. Shipshewana Lake was found to contain approximately 200 acres. The adjudication is subject to Commission review through its AOPA Committee if a party files objections to a nonfinal order by the administrative law judge, but no party filed objections. As anticipated by rule, the Secretary of the Commission issued a final agency order.

The second element of IC 14-15-3-11 applies where, as here, the first element was satisfied. In determining whether to adopt a rule to exempt Shipshewana Lake from the ten-mile-per-hour speed limit, the Commission evaluates whether the rule would under subsection (a) cause either:

- An unreasonable hazard to persons
- An unreasonable harm to fish, wildlife, or botanical resources

Additionally, under subsection (c), the Commission may grant a petition but set regulatory "restrictions for the safe operation of watercraft if unusual conditions or hazards would otherwise result by granting the exemption."

A rule to implement the citizen petition for rule change, without restrictions, could be given preliminary adoption as follows:

312 IAC 5-11-13.7 Shipshewana Lake, LaGrange County; small lake boating exemption

Authority: IC 14-10-2-4; IC 14-11-2-1; IC 14-15-3-11; IC 14-15-7-3 Affected: IC 14-15-3-10

Sec. 13.7. Shipshewana Lake in LaGrange County is exempt from the prohibition established under IC 14-15-3-10 against the operation of a motorboat in excess of ten (10) miles per hour from 1 p.m. to 4 p.m. each day of the week

(Sunday through Saturday).

Citizens who support the petition and citizens who oppose the petition have communicated with the Commission's Division of Hearings. They are both expected to seek to address the Commission. In addition, the DNR's Division of Law Enforcement and the Division of Fish and Wildlife responded to the petition as set forth immediately following:

INDIANA DEPARTMENT OF NATURAL RESOURCES RESPONSE TO PETITION TO INCREASE THE SPEED LIMIT ON SHIPSHEWANA LAKE EACH DAY OF THE WEEK FROM 1 – 4 PM

Petition

The Natural Resources Commission received a petition from adjacent property owners of Shipshewana Lake in LaGrange County requesting an exemption from the speed limit of ten (10) miles per hour every day of the week from 1-4 pm. Shipshewana Lake is considered a small lake since it has less than three hundred (300) acres and has a maximum speed limit set by state statute of ten (10) miles per hour.

Background Information

Indiana law in IC 14-15-3-11 allows an individual to petition the Natural Resources Commission to exempt boats from the maximum speed limit of ten (10) miles per hour (required by law in IC 14-15-3-10) on small lakes. A small lake is defined in IC 14-15-3-1 as a body of public water that has a surface area that does not exceed 300 acres. The state law allows the petition to request one option as set forth in IC 14-15-3-11(b):

IC 14-15-3-11

Small lakes; exemption from speed limit

- Sec. 11. (a) The commission may adopt rules under IC 4-22-2 to exempt a small lake containing more than seventy (70) acres from section 10 of this chapter if the following conditions exist:
- (1) A majority of the abutting property owners petitions the commission as provided in this section.
 - (2) An unreasonable hazard to persons would not result.
- (3) An unreasonable harm to fish, wildlife, or botanical resources would not result.
- (b) A petition under this section must specify one (1) of the following periods for exemption from section 10 of this chapter:
- (1) Each day of the week (Sunday through Saturday) from 1 p.m. to 4 p.m. (local time prevailing).
- (2) Monday, Thursday, and Saturday from 1 p.m. to 4 p.m. (local time prevailing).
 - (3) Saturday from 1 p.m. to 4 p.m. (local time prevailing).

- (4) Each day of the week (Sunday through Saturday) from sunrise to sunset if the small lake is owned, leased, or operated in whole or in part by a political subdivision (as defined in IC 36-1-2-13).
- (5) Each day of the week (Sunday through Saturday) from sunrise to sunset if the small lake is connected by a natural channel to a lake having a surface area of more than three hundred (300) acres.
- (c) The commission may not establish a period that deviates from the period requested in the petition. However, the commission may adopt rules to establish restrictions for the safe operation of watercraft if unusual conditions or hazards would otherwise result by granting the exemption.
- (d) The commission may adopt rules under IC 4-22-2 to rescind or amend an exemption granted under subsection (a) if:
- (1) a majority of the abutting property owners of a small lake that has been exempted under this section petitions the commission in substantial accordance with the appropriate corresponding requirements of subsection (f) to rescind the exemption; or
 - (2) the commission determines that because of the exemption:
 - (A) there is an unreasonable hazard to persons; or
- (B) unreasonable harm to fish, wildlife, or botanical resources is occurring.
- (e) Before the adoption of a rule under subsection (a), the commission must certify that the petition represents a majority of the abutting property owners. A determination under this subsection is subject to IC 4-21.5.
 - (f) A petition under this section must be in the following form:

To the State of Indiana

Department of Natural Resources

The undersigned, all owners of abutting property to (name of lake) and situated in _____ County, Indiana, petition the department to post time periods exempting (name of lake) from speed limits as specified in IC 14-15-3-10 as follows:

(Petition to specify one (1) of the time periods listed above.)

We certify that, according to land and water acreage maps on file with the department or certified survey attached, (name of lake) is less than three hundred (300) acres and more than seventy (70) acres, as specified in IC 14-15-3 and that the signatures listed on this petition represent a majority of bona fide property owners of abutting property of (name of lake), as recorded in the office of the county recorder of (name of county). The department may verify the validity of the signatures. We also understand and agree that this petition, when certified, may not be changed or altered within two (2) years from the date of the certification.

Signed	Lake Property Address
Date	

Law Enforcement Information

The Division of Law Enforcement has determined that a majority of the abutting land have signed the petition in favor of the speed limit change for Lake Shipshewana, a "small lake". An unreasonable hazard to persons would not result from the approval of this petition, however, if approved, we would recommend leaving the relatively narrow and shallow tail at the southeast end of the lake at 10 mph or idle only.

Fish and Wildlife Resource Information

Shipshewana Lake is a 202 acre glacial lake in Lagrange County. The lake has a documented maximum depth of 17 feet and an average depth of 5.5 ft. The lake has two inlets: (1) Cotton Lake Ditch which enters on the south end of the lake, and (2) Mud Lake Ditch which enters from the West. The outlet, Page Ditch, is located on the southeast side of the lake and flows to Taylor Lake and eventually the Pigeon River. The Shipshewana Lake watershed is comprised of 3,854 acres, 78% of which is agricultural.

Shipshewana Lake is a historically shallow lake. Bottom substrate of the lake is typically muck and sand. A feasibility study conducted by International Science and Technology concluded that sediment should be removed in order to improve water quality. In 1999, a dredging project was undertaken and approximately 227,500 cubic yards of sediment was removed from the lake (primarily in the northeast basin). However, due to lack of funding, the project was never completely finished.

In May 2011, DNR Lake and River Enhancement staff conducted a hydroacoustics survey to determine the current bathymetry profile of the lake. Though a maximum depth of 17 feet was found, average depth was only approximately 5 feet and little evidence of the dredging project was observed (Figure 1). The study also showed that only 3% of the lake was 10 feet or deeper by volume and 7.7% by surface area (Table 1).

The shallow nature of the lake has created nearly annual algae blooms and occasional fish kills. At the time of the hydroacoustics survey, water clarity (secchi depth) was only two (2) feet, and water was green in color due to an algae bloom in progress.

The shoreline is approximately 50% developed by residences. Most of the homes have either natural, unmodified shorelines or minor alterations such as glacial stone. Erosion was evident in some areas where homes did not employ structural armoring along the shoreline. Specifically, homes on the west side of the lake without shoreline protection were experiencing significant erosion to the shoreline. In areas, the shoreline was one foot tall and vertical due to excessive erosion. Only twelve (12) bulkhead seawalls were observed while on site, with the majority of them occurring on the east side of the lake. Little to no erosion issues were observed on this side of the lake.

A wetland complex is located along the north shoreline. Conservatively estimated at forty (40) acres, it is comprised typically of cattails and various scrub/brush species. It also

provides a large refuge for various waterfowl species. Spatterdock and white water lily are present lakeward of the wetland complex and water is shallow. An additional wetland complex is present on the southwest end of the lake. Though considerably smaller than that located on the north side, it is comprised of dense wetland bush.

Aside from lakeward of the north wetland complex, emergent vegetation beds are relatively scarce throughout the lake.

Historic permits for Shipshewana Lake indicate that no rare, threatened, or endangered species have been documented within the general vicinity of the lake.

Impact of Proposed Action on Fish and Wildlife Resources

Allowing for high speed boating on a shallow, hypereutrophic lake such as Shipshewana may pose significant threats to the fish, wildlife, and botanical resources of the lake.

Though the depth of water impacted by high speed boating is dependent on numerous factors (weather, speed, boat size, substrate, etc.), impacts from high speed boating generally occur in water depths of 10 feet or less (Asplund, 2000). According to the recent bathymetric survey conducted by the DNR Lake and River and Enhancement Program, 92-93% of the lake is shallower than 10 feet and will be impacted directly or indirectly by the speed limit increase. The primary impact created by boating is increased turbidity, which may have negative impacts on the water quality, fish populations, wildlife, and botanical resources of the lake.

Water quality

The water quality of Shipshewana Lake is likely to degrade if high speed boating is authorized. Shipshewana Lake has a very significant algae problem that is likely the result of excess nutrient input from its watershed, specifically phosphorus and nitrogen. Nitrogen is more soluble in water and typically breaks down easier or is more readily absorbed by aquatic plants. Many nutrients, including the algae-producing phosphorus, are bound to the sediment particles on the lake bottom. Boating at high rates of speed disturbs the lake bottom and resuspends bottom sediments. Disturbance due to boating is likely to dissociate these bonds, creating more free nutrients in the water column, and a greater chance of algae blooms (the phosphorus becomes available to algae, which causes accelerated growth and reproduction). Yousef et al. (1980) found that in three Florida lakes less than 18 feet deep, high speed boating resulted in 28-55% increases in phosphorus. Additionally, maximum increase in turbidity and phosphorus levels increased within the first two hours of boating activity and turbidity took more than 24 hours to return to initial levels.

Due to its large watershed and dominance of agricultural practices, this lake already receives high number of nutrients, is typically turbid, and has an overabundance of algae (Weed Patrol, 2006). When algae die, they are consumed by bacteria which require oxygen. This spike in oxygen use by bacteria often depletes the water column of oxygen that is typically available to fish. Fish kills, which have occurred on this lake despite its reduced speed limit, could dramatically increase as a result of high speed boating.

Water quality may also be diminished as a result of increased erosion on shorelines. Erosion was already prevalent along the west side of the lake where the lake-shore interface is largely unprotected. High speed boating will increase the rate of erosion, allowing for more sediment to enter the lake and increase turbidity.

Fish

According to the most recent DNR fish population survey conducted in 2002, Shipshewana Lake contains a good sportfish population (Koza, 2002). The number of harvestable bass (≥14.0 in) has been documented as one of the highest in the state. As a result, Shipshewana Lake has been popular among bass anglers. The lake also supports adequate populations of bluegill and black crappie.

High-speed boating may negatively impact fish in Shipshewana Lake, both on an individual level and population level. The increased turbidity that is likely to result from high-speed boating has been documented to negatively affect fish's nesting, feeding, and overall reproductive success (Asplund, 2000). There will likely be less habitat for fish to live and locations for fish to spawn. Additionally, because little deep-water habitat is available in the lake, fish have little area of the lake to retreat to if physically disturbed by boats.

Typically, physical disturbance by boats may occur, specifically during spawning and in shallow water habitat. However, it is more likely that the direct impacts that boating have on habitat degradation and water quality will more profoundly impact fish populations of the lake. For example, northern pike have historically been present in Shipshewana Lake; however, none were recorded in 2002. Because northern pike typically require cool, cleaner water, it may be plausible that their disappearance from the lake is due to deteriorated water quality.

Finally, it should be noted that Shipshewana Lake has experienced periodic fish kills due to algae blooms and the resulting low dissolved oxygen levels. Although a complete kill has not occurred, extreme concern persists that high-speed boating may exacerbate the potential for and extent of future fish kills.

Plant community

Similar to fish populations, impacts to water quality and clarity may indirectly affect the plant community of Shipshewana Lake. Historically, Shipshewana Lake has had low species diversity of submerged aquatic plants. Now dominated by coontail, the lake has had problems with the invasive Eurasian Watermilfoil in the past. In 2006, Weed Patrol (now Aquatic Weed Control, Inc.) conducted a whole-lake flouridone treatment to chemically eliminate Eurasian watermilfoil from the lake. In 2009, only three species of submerged aquatic plants were found (Sago pondweed, Coontail, Water stargrass), all within water that was five (5) feet or shallower.

Though plant growth is limited to shallow depths, presumably due to low water clarity, increases in turbidity may be additionally negative for the plant community. Murphy and

Eaton (1983) showed that submerged plant growth was negative correlated with the amount of high-speed boat traffic on a lake. This was largely attributed to the increased turbidity and levels of total suspended solids that resulted from boating activity. Additionally, they noted that emergent vegetation was also negatively affected, but this was typically due to physical disturbance by boats and sheering by propellers.

An additional concern for vegetation growing in shallow water is scouring. As a boat passes though shallow water, a scour channel may be left in the sediment. This is likely to uproot and dislodge vegetation (submerged and emergent). Zeiman (1976) noted that these channels are likely to persist for many years without the ability for vegetation to reestablish.

<u>Wildlife</u>

Boat activity certainly causes many wildlife species to be disturbed from a variety of activities. For some species, this may represent just a temporary disturbance, with little long-term effect. For other species, or in cases where unique habitats are disturbed by high frequency or intensity of boat use, boat activity can have effects on the entire population. Migratory birds may require more protection as their energy needs can easily be disrupted by excessive disturbance (Asplund, 2000).

The most notable area of the lake to support a diversity of wildlife is the wetland complex located on the north side of Shipshewana Lake. Waterfowl and other aquatic wildlife using this lake may be negatively impacted by high speed boating in this area, specifically by nest disturbance, temporary flushing, and harassment from associated motor noise. Numerous studies have been conducted documenting flushing activities related to boating. Rodgers and Smith (1995, 1997) directly measured the flushing response of sixteen (16) waterbird species exposed to 5 different human activities, including walking, ATV, motorboat, canoe, and automobile. In both studies, the authors recommend buffer zones of 100 meters to protect most bird species, or mixed colonies of either nesting or foraging birds (Asplund, 2000).

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Additional Information

The Natural Resources Commission received a letter from the Shipshewana Community Lake Improvement Association in August of 2010 (Exhibit A) citing their concerns and opposition to this request for the increase in the speed limit, citing the re-suspension of sediments that would further contribute to the substantial negative effects on water quality and the disturbance to aquatic plants and shoreline erosion that would likely result. The Indiana Department of Environmental Management (IDEM) found multiple types of blue green algae and a type of algae that has not been previously seen in a lake in Indiana at Shipshewana Lake this summer.

Recommendation

Because of unreasonable harm to fish, wildlife, and botanical resources pursuant IC 14-15-3-11(d)(2)(B), the Department of Natural Resources recommends that this request not be approved to modify the speed limit on Shipshewana Lake. Shipshewana Lake is shallow and already suffers from water quality issues. Water clarity is low and annual algae blooms have become a common nuisance. The negative effects of high speed boating will likely be exhibited by further deteriorating water quality, increasing the probability of algae blooms and fish kills, diminishing the plant community, disturbing habitat for fish spawning, and disturbing aquatic wildlife on Shipshewana Lake.

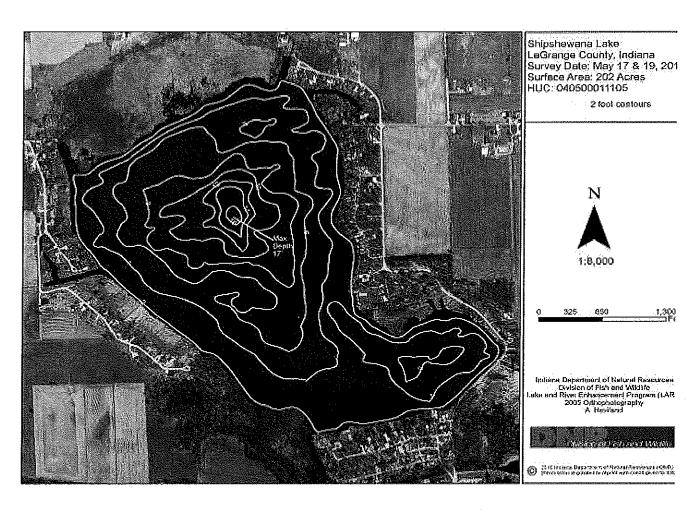


Figure 1. Bathymetric map of Shipshewana Lake as of May, 2011. Created by IDNR Lake and River Enhancement staff.

Shipshewana Lake, LaGrange County Approx. 200 Ft. Buffer from Shore



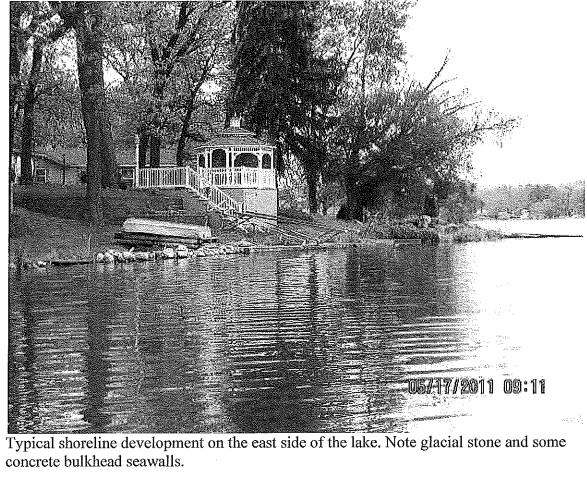


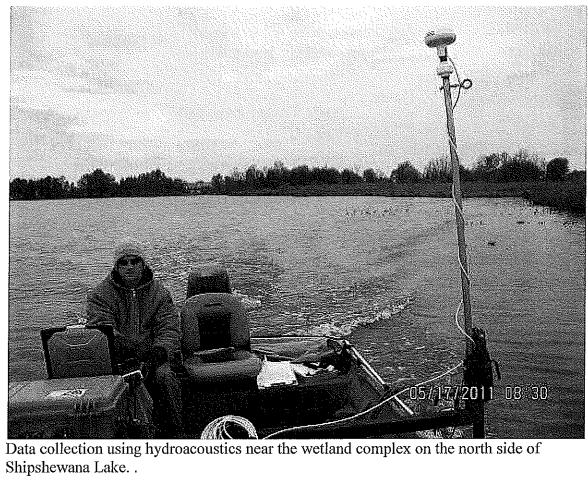
Figure 2. Algae bloom observed during the site visit, 5-17-2011.

Table 1. Cumulative area and volume of 1-ft depth contours and cumulative percent of each. Bold text represents the parameters for 10 ft and deeper

Depth (ft)	Cum Area (m²)	Cum. volume(m³)	Cum. % Vol	Cum. % Area
17.0	558.7	34.2	0.0	0.1
16.0	2576.6	479.3	0.0	0.3
15.0	7028.4	1943.5	0.1	0.8
14.0	11747.2	4793.3	0.3	1.4
13.0	16531.4	9098.6	0.6	1.9
12.0	24890.2	15195.9	1.1	2.9
11.0	42606.3	25176.3	1.8	4.9
10.0	66526.7	41609.5	2.9	7.7
9.0	101356.5	66973.5	4.7	11.7
8.0	142857.2	103828.2	7.3	16.4
7.0	205507.2	156216.3	10.9	23.7
6.0	298880.4	233115.2	16.3	34.4
5.0	409482.2	339780.3	23.7	47.1
4.0	560616.9	486561.9	34.0	64.5
3.0	711406.9	681935.5	47.6	81.9
2.0	812320.7	917412.2	64.1	93.5
1.0	845637.6	1170320.9	81.8	97.3
0.0	868764.0	1431291.3	100.0	100.0

Site Photos, 5-17-2011







Spatterdock and cattails associated with the north wetland complex. Water in this area was generally 2 ft deep or shallower.



Houses and sparse shoreline development on east side of the lake, looking south.

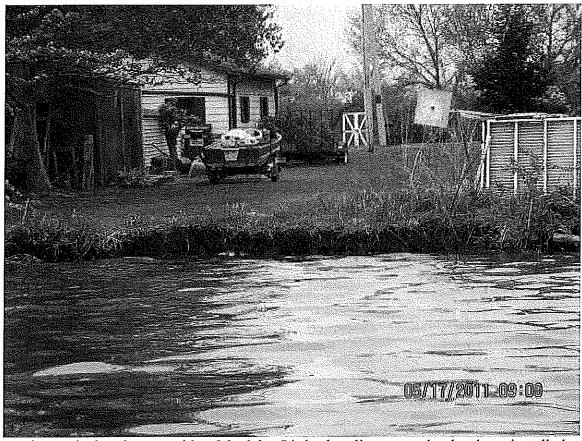


Multi-culvert outlet to Page Ditch. Large of spatterdock is associated with this shoreline.

18



Middle of the lake looking north at the 40 acre wetland complex.



Erosion typical to the west side of the lake. Little shoreline protection has been installed along these properties.



Erosion typical to the west side of the lake.



Northeast end of the lake and the eastern-most edge of the large wetland complex. Note cattails and brush that characterizes this habitat.

- Copper as

SHIPSHEWANA COMMUNITY LAKE IMPROVEMENT ASSOCIATION P.O. BOX 915, SHIPSHEWANA, IN 46565

August 4, 2010 CERTIFIED MAIL

Natural Resources Commission Division of Hearings Indiana Government Center, North 100 North Senate Ave. Room N501 Indianapolis, IN 46204

Dear Commission Members:

Re: Shipshewana Lake, LaGrange County/Administrative Cause Number 10-140L

I am, along with other Directors of the Shipshewana Community Lake Improvement Association, writing to express our collective concern and opposition to a recent petition being circulated among Shipshewana Lake property owners. The petition is for an exemption to the mandatory 10 mph speed limit imposed upon motorized watercraft operating on lakes smaller than 300 acres across Indiana.

Upon reviewing Indiana Code IC 14-15-3-11 which addresses the means by which an exemption may be petitioned by a majority of abutting property owners, we understand that the criteria for consideration for the exemption must meet Section 11 (a) (3)" An unreasonable harm to fish, wildlife, or botanical resources would NOT result." To that point we offer the following:

The S.C.L.I.A. charter is "to promote conservation efforts to improve and maintain the water quality of Shipshewana Lake". We emphatically believe that to grant a speed limit exemption would be contrary to the long term welfare of Shipshewana Lake. The physical, chemical and biological characteristics of the lake make it very susceptible to damage due to high speed boating. The lake is a shallow muck bottom lake with all of the inherent issues. The lake is 202 acres with the deepest part residing at 14 feet deep in a through 150 feet long and 30 feet across. The remaining acreage averages six feet in depth. Allowing high speed watercraft will result in multiple effects on the aquatic ecosystem.

Firstly, high speed boating can exacerbate negative effects of phosphorus by resuspending sediment in oxygenated waters, causing the bound phosphorus to release from the substrate and become available for use by algae and other plants in the water. Total phosphorus was shown to increase by 17 to 73% with boating activity, resulting in substantial negative effects on water quality due to recreational boating on shallow lakes. Our concern is the obvious contribution this activity would bring to the algae problem already in evidence. Studies show that mixing, increased wave action and shredding of plants and substrate by boat propellers exacerbate the aging process in lakes that are already experiencing high sediment and nutrient inputs. Water quality in Shipshewana Lake, specifically, is currently degraded due to inadequate sewage treatment and the influx of high concentrations of nutrients from surrounding farmlands. S.C.L.I.A. has been conducting a preliminary watershed study to verify what contaminants are entering the lake and to establish their origins.

Natural Resources Commission
Division of Hearings
Re: Shipshewana Lake, LaGrange County/Administrative Cause Number 10-140L
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The Soil and Water Conservation District of LaGrange County was recently awarded a grant to study the St. Joseph River Water Basin as Shipshewana Lake is a tributary to the Pigeon River which flows to the St. Joseph River.

Secondly, aquatic plant disturbance and shoreline erosion are serious issues exacerbated by boat traffic. The destablization of the surronding shoreline has been an ongoing issue at Shipshewana Lake. Despite the fact that the Shoreline Stabilization Project, which was awarded as part of the 1997 Dredging Project, provided for coconut fiber logs to be planted in and behind emergent shoreline plantings, we continue to experience a steady encroachment on existing shorelines. Individual property owners have aggressively attempted to stabilize their respective shorelines by introducing additional plantings and natural stone. Wave energy from high speed boating, water skiing, and jet skis will increase shoreline erosion requiring additional shoreline stabilization and destroy stands of emergent plants that are critical for maintaining shorelines, controlling sediment and nutrient impacts, and providing habitat for sportfish. We can not emphasis strongly enough our concern over the direct damage that would be caused to shorelines by boat traffic in shallow areas. The demise of important aquatic plant beds would further facilitate an invasion by nuisance algae and exotic plant species while simultaneously resulting in physical property loss.

We further understand that IC 14-15-3-11 Sec. 11 (e) Before adoption of a rule under subsection (a), the commission must certify that the petition represents a majority of the abutting property "owners". Our concern rests with the fact that a good number of the current people in residence are renters and not the actual property owners and, as such, can not lawfully sign the petition. In addition, owners residing on lake channels should not be viewed as valid signatories as the resulting negative impact of high speed watercraft does not directly affect their property. We trust that these issues will be taken into account when the commission duly certifies "that the petition represents a majority of the abutting property owners." We have noted that in the language of the IC it states that "the department may verify the validity of the signatures" as well.

The Board respectfully requests that the members of the Commission give serious consideration to our concerns and takes them into account when rendering their decision to the above referenced petition for an exemption to the current 10 mph speed limit currently in force.

Sincerely,

Shipshewana Community Lake Improvement Association

Stephen N. Weideman President & Director

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